

W5YI

Nation's Oldest Ham Radio Newsletter

REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable. May be reproduced providing credit is given to The W5YI Report.

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FCC Proposes UHF-FM Family Radio Service

"...any American citizen, firm, group or community unit may privately transmit and receive short-range messages over certain wave lengths. From mere listeners or spectators, as they are now, people in homes and offices throughout the country will become active participants." E.K. Jett, FCC Chairman, July 1945.

First, a little history!

Exactly fifty years ago, former FCC Chairman E. K. Jett became the "father of personal radio." He was a commissioner from 1944 to 1947. His imagination had been fired up by a young and avid ham operator by the name of Al Gross, W8PAL who had developed a pocket-sized two-way radio for UHF operation.

The Gross radio was soon adopted for use by United States intelligence agents behind German enemy lines during World War II. Called the "Joan-Eleanor" radio, the minuscule transceiver became the prototype for the first UHF-CB radios to be produced by the young inventor after the war.

Jett was the first FCC official to propose extending the use of two-way radio to citizens. His proposal resulted in the issuance of an FCC report (Docket 6651, January 15, 1945) on a "proposed allocation from 25,000 kilocycles to 30,000,000 kilocycles" (25-300 MHz). From this, the "Citizens Radiocommunication Service" was established. Al Gross was at many of the FCC meetings and demonstrated his "Joan-Eleanor" radio. What the FCC planned, and what the public ended up with, however, are two different things.

Jett's idea of two-way personal radio was chronicled in the July 28, 1945 edition of the Saturday Evening Post entitled "Phone Me by Air." Commissioner E. K. Jett told how "The remarkable progress achieved during the war had opened the door to a large variety of new applications of radio."

Jett said. "In 1925, the useful radio spectrum stopped at 3000 kilocycles. By 1940, the ceiling for allocations was 300,000 kilocycles, but only the frequencies up to 100,000 kilocycles were really in effective use. After the outbreak of hostilities in Europe in 1939, very rapid strides were made in opening up frequencies above 300,000 kilocycles. ...The usable spectrum which in 1914 was only about twice as big as the present broadcast band of 1050 kilocycles, is now more than 15,000 times as large."

"Although the wartime expansion has not created an unlimited number of frequencies, it has enabled the FCC to meet the increasing requirements of various users and to provide also for certain new services such as the Citizens' Radio."

"In making provision for the Citizens' Radio, the FCC sought to locate it as far down as possible in the spectrum. ...the lowest place it could assign for the personal use of citizens was the

460,000 to 470,000-kilocycle band." Jett told how "sky signals ...strike layers of heavily ionized air and are reflected back to the surface of the earth at points far from the transmitter..."

"In the 460,000-kilocycle band, sky waves do not have to be taken into account, day or night. The only ones that matter are those parallel to the ground. ...Citizens in two towns only fifteen miles apart -- or even less if the terrain is especially flat -- will be able to send messages on the same lanes at the same time without getting into one another's way. ...Thus the 460,000-to-470,000 kilocycle band is expected to furnish enough room for millions of users."

"Walkie-talkies will be transported in small cases like portable typewriters," he said. Their transmissions will cover three to five miles. The handi-talkies will reach one to two miles. The short range will be due partly to the low power that will be employed, with as little as one half watt for the 'handies' and two watts for the 'walkies.'"

"Far-reaching progress has been made during the war in dry-cell batteries, however, and their length of service has been greatly extended. If, as probably will often be the case, a person keeps his equipment turned on only fifteen or twenty minutes a day, on an average, a battery of this type will last almost indefinitely.

"Although Citizens' Radio equipment hasn't reached the blueprint stage, leading manufacturers tell us that, not long after the war -- after quantity production starts -- walkie talkies probably will retail for about \$100, and handi-talkies for approximately \$50. One large manufacturer expects the cost to be somewhat below those figures. ...engineers will have to do some experimenting to produce tubes and circuits to fit the frequencies in the 460,000-kilocycle band."

Jett told about "relay transmitters at various locations which will automatically pick up and repeat signals on a certain wavelength and spread them throughout the area." He even envisioned selective calling whereby the radio would be activated "...based on the transmission of certain combinations of telegraphic impulses. ...It would function in very much the same manner as the telephone, so that quiet would prevail at all times except when you were being called."

Jett wanted easy access to the service, minimum regulations and free licensing. "...it will be up to the people to demonstrate that this service is necessary and valuable or, as the Communications Act of 1934 states, 'in the public interest, convenience or necessity.' The commission is even prepared to abolish it if there isn't enough demand for it. On the other hand, if its usefulness justifies the step, more frequencies will be made available. ...Manufacturers say that these sets

may sell at the rate of hundreds of thousands and, eventually, as prices are brought down or their popularity grows, even millions a year."

Remember, all of this was written exactly fifty years ago! One thing that Commissioner Jett did not foresee, however, was transistors and micro-miniaturization. He felt that handi-talkies would weigh only "six pounds or so" and be "about three inches square and twelve inches long." Bell Laboratories did not develop the transistor until the late 1940's.

Class "A" Citizens' Radio

A couple of years later, the Federal Communications Commission adopted rules seeking to implement Jett's dream of UHF citizens' radio. Class "A" was the original citizens band radio service which was inaugurated on April 10, 1947. Al Gross, W8PAL got the first experimental licenses, W10XVX and W10XVY and went into the UHF radio manufacturing business.

High equipment costs - and few people to talk to, however, doomed UHF citizens radio. The FCC found that business use of 450-470 MHz far outstripped the "personal radio" applications and soon they began re-assigning the Class "A" frequencies to purely land mobile use. Using 25 kHz spacing, Class "A" once had spectrum room for 400 channels.

The band was later reduced to 48 specific channels and today there are only 16 -- often referred to as eight pairs. (8 for base-mobile and 8 for mobile only.) The remnants of Class "A" personal radio is now known as the General Mobile Radio Service. There are relatively few users and the licensing process is complicated. GMRS operates in the UHF band at 462 and 467 megahertz. The reason for the pairing is because most users operate duplex - sending and receiving at the same time -- the same way you talk on the telephone.

High frequency CB

The promise of lower equipment costs encouraged the FCC in 1957 (Docket 11994) to allocate 23 crystal controlled channels to a new Class "D" Citizen's Radio Service in the old 11-meter ham band. Amateurs called it the "junk band" because it was assigned for use by ISM (Industrial, Scientific, Medical) devices such as diathermy. The band noise was awful!

While amateurs essentially did not use the 11-meter band, they screamed bloody-murder when they lost it. The ARRL fiercely lobbied against the creation of CB on 27 MHz. They even brought up the point that the 1947 Atlantic City Treaty specified the band "for Amateur use." The following September, however, CB radio was "open for business" on 11-meters. The

FCC simply disregarded Commissioner Jett's warning that sky waves had to be taken into account and went with the wishes of industry who could build relatively inexpensive radios to work at HF.

In 1970, Channel 9 was designated for emergency use only and no longer could you build a CB radio from a kit. Radios would now be type-accepted by the FCC laboratory. Then it hit! The 1974 energy crisis, the new 55 MPH speed limit and searching for gas and "Smoky" catapulted the service to some 30 million users. CB became the national fad.

In 1976 alone, the FCC issued more than 5 million new CB radio licenses. Effective January 1, 1977, the service expanded from the original 23 crystal-controlled channels to 40. And CB manufacturers were stuck with millions of obsolete radios!

The long range HF band was ill suited to short range personal or business communications and CB radio became a hobby band. The FCC had given a cannon to two-way personal radio users and told them to shoot squirrels. CB'ers were limited to the length and distance of their radio contacts. Calling CQ was against the rules. None of it made any sense and CB'ers universally lined up against the FCC.

When the rules were tightened up, CB radio became undisciplined, chaotic and congested. To avoid detection, "handles" surfaced instead of callsigns. The end was inevitable. The service basically self-destructed in the early 1980s -- primarily because the FCC failed to listen to Commissioner Jett and his vision of UHF citizen's radio. The 11-meter band has now been "fenced off" and the remaining users pretty much fend for themselves.

There can be no doubt, that over the years, two way personal radio for the masses was badly bungled by the Commission. One fact has become apparent, however: the public has a strong desire and need for personal two-way radio communications.

Back to square one

On July 20, 1994, the Radio Shack division of the Tandy Corporation petitioned the FCC to create an unlicensed UHF-FM low power 2-way voice Family Radio Service (FRS.) The new service would share unused and little used General Mobile Radio Service (GMRS) spectrum at 462 and 467 MHz. "The service would employ state-of-the-art technology and could be conveniently accessed by using light weight, palm sized transceivers."

Tandy told the FCC that FRS would help meet the growing public demand for an affordable and practical way of direct communication among individuals and that the new service "...can be established without allocating new spectrum and with virtually no impact on

present radio users."

Tandy said the Family Radio Service would not only benefit public service groups who provide communications that are vital to the public interest, it "...also will serve the needs of the general public. Parents will have an extra measure of security by using FRS to monitor their children at play. Families and friends will be able to maintain close contact at sporting events, shopping malls, parks and between vehicles during trips. Impromptu groups will be able to communicate conveniently using FRS for activities such as fund raising and social events."

"Immediate unlicensed access to FRS will be a driving force in promoting activity on the band. GMRS and other FCC licensing requirements are a formidable barrier to many individuals who might otherwise avail themselves of such radio services. Absent such impediments, FRS will flourish," Tandy said. It all sort of sounded like Commissioner Jett talking some fifty years ago.

Technical specifications

"The equipment envisioned for FRS is a palm-size transceiver with a very short antenna -- smaller and more convenient than a handheld CB unit -- but providing clear, short-range FM communications. Tandy anticipates that FRS units will be available in a variety of configurations, including features such as private channel calling via CTCSS (Continuous Tone Controlled Squelched System), priority channel calling, channel scan, etc. More advanced FRS units may include such features as programmable tone-coded ID numbers that can be used to access individuals or groups of users."

Tandy has already conducted extensive field tests in numerous situations, both in and outdoors, including residential and shopping areas, office buildings, sporting arenas, open fields, across water, vehicle-to-vehicle, and recreational venues such as parks and playgrounds ...including the Walt Disney World theme park. "Tandy has determined that a transmitter power of 500 milliwatts will provide reliable clear communications while allowing the unit to operate for only pennies on small dry cell batteries."

Tandy proposed that "FRS will offer distinct advantages and flexibility which will result in more efficient spectrum usage by adding new users on the seven unused and seven underutilized interstitial channels in the GMRS spectrum." An interstitial channel is one sandwiched in between the existing eight pairs.

In 1988, the FCC released the seven 462 MHz interstitial channels for simplex operation. The seven 467 MHz interstitial channels were "warehoused" to

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permit the GMRS community to present to the Commission a comprehensive plan for enhanced GMRS repeater usage. Tandy said, to date, "...no plan has been advanced nor has the use of the 467 MHz channels been requested." The present eight paired GMRS frequencies in megahertz are:

Base/Mobile	Repeater	Base/Mobile	Repeater
462.550	467.550	462.650	467.650
462.575	467.575	462.675*	467.675*
462.600	467.600	462.700	467.700
462.625	467.625	462.725	467.725

(* = Must be used for travelers or emergency assistance.)

GMRS users are normally assigned only one or two channel pairs, but may operate simplex on any of the seven 462 MHz interstitial frequencies. (** = See below.) As a general rule, GMRS stations may radiate up to 50 watts output power. Licensing is complicated and lengthy. Personal and business communications are authorized to the licensee and his/her immediate family; but phone patching and "advertising/sales promotion" are not permitted. GMRS users may not communicate with Amateur Service licensees except during an emergency. The Family Radio Service would be a Part 95 Personal Radio Service, the same as CB and GMRS radio. The proposed direct FRS frequencies:

Assigned**	Unassigned
Interstitial Channels	Interstitial Channels
1. 462.5625 MHz	8. 467.5625 MHz
2. 462.5875 MHz	9. 467.5625 MHz
3. 462.6125 MHz	10. 467.5625 MHz
4. 462.6375 MHz	11. 467.5625 MHz
5. 462.6625 MHz	12. 467.5625 MHz
6. 462.6875 MHz	13. 467.5625 MHz
7. 462.7125 MHz	14. 467.5625 MHz

Tandy also feels the public interest would be well served by permitting FRS users to access the GMRS 462.675/467.675 MHz emergency/traveler's aid repeater channel pair which they believe should be open to all users.

The preliminary comments

The FCC accepted the proposal on July 26, 1994 as having merit, assigned it file No. RM-8499 and put the item out for a 30 day public comment period.

While Tandy says the current non-repeater channels are "underutilized" - the Personal Radio Steering Group, an Ann Arbor, Michigan based GMRS user association headed up by ham operator Corwin D. Moore, Jr., WB8UPM strongly disputed that claim.

PRSG vehemently opposed the mixing of licensed and unlicensed operators on the same frequencies and they believe that FRS will "disrupt and impair both current and future GMRS operations..." PRSG said that alternative spectrum is available including the new PCS

bands at 800 MHz. The Uniden Corp. said that PRSG is fearful of an expanded user base or the more efficient use of the GMRS spectrum. "It appears that PRSG is making an attempt to protect their own network of GMRS licensees by making unsubstantiated comments against the potential for FRS," it said.

REACT International, basically a CB association dedicated to public service - supports the concept of the Family Radio Service, but opposes the use of GMRS spectrum for it which they also utilize for their public service activities. "The General Radio Mobile Service is not capable of handling an influx of thousands (or millions) of users that would result from the Tandy proposal." REACT also fears that "...the GMRS 675 emergency channel pair will be abused by unknowledgeable and unlicensed users."

Motorola, on the other hand, supported the Tandy/Radio Shack proposal "...the public interest is better served by the creation of a new unlicensed personal radio service that offers consumers improved communications options in a cost-effective manner." Motorola suggested that FRS be given co-primary status, not merely secondary status, for operation on the GMRS interstitial frequencies. Motorola argues that Tandy's proposal is the proper compromise between a low cost sophisticated two-way radio service that provides greater service reliability than the Citizens Band (CB) Radio Service and a complex service that would require more regulatory oversight.

The Telecommunications Industry Association forecasts a "potential strong market" for FRS with applications varying from "...parents keeping in contact with children, local watch patrols monitoring neighborhood activities, small businesses improving efficiency through radio, and outdoor recreationists enhancing the enjoyment of their activity while increasing their safety as well." TIA argued that for the FRS to achieve broad market appeal, it would have to be an unlicensed service.

Both Motorola and TIA agree there is a need for a low cost unlicensed very short distance two-way voice radio service, and that technical standards can be crafted to adequately protect GMRS systems. TIA says that consumer acceptable radios will have to provide selective calling. Motorola states that the bandwidth of the transmissions should be limited to 12.5 kHz.

Notice of Proposed Rulemaking

After the preliminary round of comments, the FCC proposed new rules on June 22, 1995, which looks towards implementing the Family Radio Service as requested by Radio Shack. The public announcement of the new service was not made until July 17, 1995, however.

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NOTICE OF PROPOSED RULEMAKING ISSUED ON FAMILY RADIO SERVICE - WT Docket No. 95-102.

The text of the NPRM was released on August 2, 1995. In it, the FCC said "We believe that this service would provide most small groups, such as families, friends, and associates, with good quality voice communications over a range of a few city blocks. It would facilitate activities where members become separated, either planned or inadvertently. It would also be useful to hunters, campers, hikers, bicyclists, and other outdoor activity enthusiasts. It appears that technology can make such a service very convenient to use and widely affordable. [The only costs to the user would be the cost of the FRS units, estimated to be \$100-\$150 each and the cost of replacement batteries.] Further, FRS would create new jobs as well as provide more choices for consumers. We propose, therefore, to amend the rules to establish a Family Radio Service.

"Each channel would be usable simultaneously by many millions of small groups throughout the country. The technical standards proposed by Tandy should provide good quality communications over a range of approximately one kilometer. A number of factors, however, limit the interference potential of these units. First, there is the line-of-sight propagation characteristic of frequencies in the UHF domain. Next simple antennas that are an integral part of the unit together with its very low transmitter power will further restrict its range. Another feature is the capture effect provided by FM emission types. [Capture effect is the phenomenon whereby the strongest signal received on a frequency is the only signal that is demodulated by a FM receiver tuned to that frequency.] We agree that selective calling would help enable this service to co-exist with the GMRS as well as make it possible for user groups to enjoy a modicum of privacy.

"Tandy, Motorola, and TIA state that for FRS to be attractive to users, there should be no requirements for operator or station licenses. We agree. We can not foresee any regulatory purpose that would be served by requiring operator or station licenses in such a radio service. We propose, therefore, to establish the Family Radio Service within the Citizens Band (CB) Radio Service and authorize operation by rule under Section 307(e) of the Communications Act [which authorizes the operation of such radio stations without an individual license.] We propose to regulate the usage of the FRS units through technical standards and type certification. We propose to rely upon four simple operating rules [covering eligibility and responsibility, authorized locations, types of communications and equipment requirements.]

"We are not persuaded by the claim that unlicensed

ed FRS units are incompatible with the GMRS. We believe that these two services can share certain channels successfully. ...We also propose technical standards similar to those requested in the petition and the comments. The units would transmit frequency modulated voice emission type F3E only. The authorized bandwidth would be 12.5 kHz. The maximum power of the transmitter would be one-half watt. The antenna must be an integral part of the transmitter, have no gain, and be vertically polarized."

The FCC also asked whether any of the proposed technical standards need to be relaxed or tightened, and whether other standards should be included in the rules. The Commission did not propose to permit telephone interconnection (phone patching) but asked whether it should be permitted, and if so, what restrictions or conditions that should be imposed. Selective calling is not required, but is allowed as an FRS option. Strangely, no mention was made in the NPRM of Tandy's suggestion that FRS users would benefit by gaining access to the GMRS 462.675/457.675 emergency/traveler's aid repeater pair.

Comments on WT Docket No. 95-102 close on October 2, 1995. Reply comments: October 16.

AMATEUR RADIO CALL SIGNS

...issued as of the first of August 1995:

Radio District	Gp."A" Extra	Gp."B" Advan.	Gp."C" Tech/Gen	Gp."D" Novice
0 (*)	AA0YS	KG0YM	(***)	KB0TNA
1 (*)	AA1OC	KE1CO	N1VPK	KB1BTJ
2 (*)	AA2YE	KG2DP	(***)	KB2VLB
3 (*)	AA3MH	KE3UK	N3VWC	KB3BKH
4 (*)	AE4LE	KT4BQ	(***)	KF4CDQ
5 (*)	AC5EF	KK5RM	(***)	KC5QAC
6 (*)	AC6PB	KO6YR	(***)	KE6WKS
7 (*)	AB7LS	KJ7QJ	(***)	KC7MMC
8 (*)	AA8UI	KG8SY	(***)	KC8AQN
9 (*)	AA9PT	KG9DR	(***)	KB9LFJ
N.Mariana Is.	KH0S	AH0AW	KH0ED	WH0ABC
Guam	WH2Q	AH2DA	KH2ON	WH2ANM
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAG
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii	(**)	AH6OE	(***)	WH6CXN
Kure Is.			KH7AA	
Amer. Samoa	AH8O	AH8AH	KH8CJ	WH8ABD
Wake W.Peale	AH9C	AH9AD	KH9AE	WH9AAI
Alaska	(**)	AL7QD	(***)	WL7COF
Virgin Is.	WP2R	KP2CG	NP2II	WP2AHZ
Puerto Rico	(**)	KP4ZY	(***)	WP4NAI

*=All 2-by-1 "W" prefixed call signs have been assigned in all radio districts. 2-by-2 AA-AK call signs now being assigned.

**=All Group A (2-by-1) format call signs have been assigned in Hawaii, Alaska and Puerto Rico.

***=Group "C" (N-by-3) call signs have now run out in all but the 1st and 3rd call district.

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INTERNATIONAL AMATEUR RADIO PERMIT

The American Radio Relay League filed a 30-page petition for rule making on July 19 seeking to implement the Inter-American Convention on an International Amateur Radio Permit (IARP). It appears that "international roaming" is about to become a reality as the various nations become parties to the Treaty. The United States has already become a signatory.

The 25th General Assembly of the Organization of American States (OAS) held June 5th at Montrouis, Haiti, adopted the IARP. This permit allows radio amateurs who are citizens of and licensed in countries which are a party to the convention to operate temporarily in other OAS nations without further licensing.

U.S. and foreign radio amateurs currently are able to operate their stations during temporary visits to other countries based upon certain bilateral agreements commonly referred to as reciprocal licensing. With the exception of Canadian citizens, the amateur radio operator must submit licensing paperwork to the FCC in Gettysburg or the licensing authority of a foreign nation. This procedure is time consuming and burdensome. Canadian and U.S. citizens may operate their equipment in the neighboring country without further licensing due to the existence of a 1952 Treaty.

The ARRL pointed out that it is not necessary for the United States to rely only on bilateral agreements with other countries for reciprocal amateur radio licensing. It said the Communications Act permits the FCC to issue permits to foreign radio amateurs to operate their stations in the United States and its territories based on multilateral, as well as bilateral agreements.

The International Amateur Radio Union (IARU) has been trying for years to bring about a simpler method of permitting amateur radio operation across international borders. The IARU and the ARRL developed the concept of the IARP which is modeled after the successful International Driving Permit that has been in place for nearly 4 decades. The concept was presented to the Inter-American Telecommunication Commission (CITEL) in December of 1994 in Montevideo, Uruguay who recommended to the Organization of American States that it be approved. The OAS did so on June 8, 1995. The International Amateur Radio Permit is now a reality.

The ARRL now asks the Commission to implement the IARP in the United States through either an immediate Report and Order or a Notice of Proposed Rule Making. The League believes that it is not necessary to go through the full notice-and-comment rule making process since the rules constitute a relief of restrictions and a reduction in unnecessary paperwork.

The ARRL also points out that under the terms of

the Treaty, that it would be impossible for a foreign amateur who holds an IARP issued by that country to be prevented from operating his amateur equipment in the United States. "Thus, it would appear that the Commission in this proceeding would be doing nothing more than conforming the Commission's regulations to a self-executing convention."

The permit itself may be issued by the administration of the signatory country, or by delegated authority to the IARU organization of the signatory country.

"The League envisions that issuing authority for the IARP will be delegated to the League, as the national association of Amateur Radio Operators and the IARU member-society in the United States, pursuant to an agreement to be negotiated." But first, the League said, the FCC must adopt the necessary rules to implement the IARP convention in the United States, so as to provide for amateur radio operation by foreign radio amateurs of signatory countries in the United States and its territories.

No fee or tax may be levied on holders of IARPs by the visited country. It will be issued for a one year term (or expiration of the national license whichever comes first) in the standard languages of the Americas: English, French, Portuguese and Spanish ...and other official languages if not one of these four. Permittees must carry both their home country license and the IARP and are expected to be familiar with the operating rules of the visited country. Enforcement will be by IARP cancellation or modification.

The content of the IARP includes a statement that the document is issued pursuant to the Convention; the name, address and call sign of the holder, the name and address of the issuing authority; the expiration date of the permit, the country and date of issuance; the IARP operator class (either Class 1 or 2); a statement that operation is allowed in the visited country only in the bands specified by the visited signatory administration; and the need for notification, if required by the visited signatory administration, of the date, place and duration of stay in that country.

The operating conditions for IARP holders shall be specified by the administration of the visited country. The call sign to be used will be the amateur call sign prefix used in the home country, followed by the slant bar sign ("/") (or in telephony, the word "stroke") followed by the call sign of the amateur operator's home license.

There are only two operating license classes: a Class 1 International Amateur Radio Permit authorizes all amateur privileges in the country visited and shall be issued only to those who have proven Morse code proficiency. The Class 2 IARP allows utilization of all amateur frequency bands above 30 MHz.

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INDUSTRY & AMATEURS SOUND OFF ON 5 GHZ

Two hot petitions at the FCC are those filed by Apple Computer (RM-8653) and the Wireless Information Networks Forum (WINForum, RM-8648). These petitioners ask the FCC to allocate spectrum in the 5 GHz band to new kinds of high-speed data networks (see W5YI Report, June 15, 1995). The products would operate on an unlicensed basis.

Apple called its proposal the National Information Infrastructure (NII) Band, and WINForum calls its proposal the Shared Unlicensed Personal Radio Network (SUPERNet). Apple's NII Band would permit both indoor and outdoor operation, including "community networks" that could be similar to today's amateur packet system. WINForum's filing appears to be concerned mainly with indoor, wireless LAN and cordless telephone operation. Here is a sampling of the most interesting comments we found at the FCC:

AMERICAN RADIO RELAY LEAGUE

"[T]he longer-distance communications described in the Apple petition should be accomplished by use of licensed services, such as fixed, point-to-point microwave, for community networking and similar applications. Alternatively, PCS and existing wireline and wireless service providers can fulfill the same functions envisioned by Apple.

"Apple envisions a radio service occupying 300 MHz of valuable microwave spectrum which has no regulation at all, save for some vague inter-device compatibility based on packet protocols, which will substitute for frequency assignments, coordinated operation, and any medium access or frequency re-use regulation. ...

"[T]he Apple petition, though it offers a thoughtful concept, is not ready for serious consideration by the Commission. It is as if Apple is saying to the Commission: 'We have a good idea, but we don't know whether or not it will work; you figure it out, but don't postpone making the allocation in order to do so; we want it now.' The petition is defective and must be dismissed."

APPLE COMPUTER

"The Commission's obligation to allocate spectrum in the public interest cannot be 'delegated' to an auction. The Commission must use its judgment to determine which spectrum allocations are in the public interest. ... Market-based mechanisms, such as auctions, universally undervalue public goods (such as unlicensed spectrum) because, by definition, no entity owns the resource (i.e., has the right to exclude others) and, therefore, no bidder or group of bidders has an adequate incentive to pay market value for the resource.

"It has been suggested that a group of manufacturers could join together and collectively purchase 'unlicensed' spectrum at an auction. In such a case, however, the spectrum would lose its essential attribute - it would no longer be open to all users on an equitable, non-preclu-

sive basis, but rather would be 'owned' by a group of manufacturers, who might (or might not) permit others to use it for a fee. By analogy, it would be a country club, not a public park. And while country clubs have value (at least to those who can afford to join), they are fundamentally different from public parks."

CENTER FOR DEMOCRACY AND TECHNOLOGY

"The unlicensed wireless service as proposed in Apple Computer's NII Band Petition is in the public interest inasmuch as it: 1) promotes ubiquitous, affordable access to the NII for citizens around the country, 2) increases the diversity of information sources available on the NII, and 3) forms a platform for a vibrant new public forum for political discourse at a local and national level.

...

"We would place special emphasis on the equal access goal cited in Apple Computer's Petition and would also add an explicit requirement that NII Band services incorporate bi-directional communication for all users as a part of the basic service available to individual users."

FEDERAL AVIATION ADMINISTRATION

"The FAA does not agree that WINForum has made a case for the 'requirement' for a wireless network. We are also not convinced that the 5 GHz band is the only location for such a system. ...[T]he airport environment may be just the place where such devices could proliferate, causing interference to sensitive navigation systems on the aircraft moving about on the ground or on final approach. The potential for interference with critical aeronautical safety of life navigation systems must be avoided.

METRICOM

"Metricom is anxious to expand its service offerings and to adapt its technology to operations in other frequency bands which provide a friendlier environment and a greater possibility for growth and expansion than is currently possible in existing unlicensed bands.

"Metricom does not support the WINForum Petition as it does not appear to favor technical rules that would foster equitable entry and operation of all types of services."

MICROSOFT

"Microsoft believes that unlicensed frequencies should not be auctioned but instead should be open to all who seek to use that spectrum. If access to these frequencies is auctioned, ubiquitous access to the NII will not happen and will not be available to all at the lowest cost possible.

"It is premature to specify much about the technology to be deployed. The allocation approved by the Commission should have a minimal set of rules attached to it and must be flexible enough to accommodate both channelized access and broadband spread spectrum techniques. Power and antenna constraints should be

flexible to enable useful coverage areas so that a single device could provide neighborhood or campus-wide access or powered at a low level for wireless LAN services. ...

"Microsoft urges the Commission to seize this historic opportunity to allocate wireless data spectrum of at least 300 MHz with an adequate reserve. Now is the time to begin a rulemaking to enable the Internet and electronic information publishing - the 21st century equivalent of the impact of Gutenberg's printing press - to flourish and empower a better America."

NORTHERN AMATEUR RELAY COUNCIL OF CALIF.

"They are asking permission to create a proprietary network without paying for it. Other wireless carriers have paid unprecedented sums for our precious spectrum. If they take the lead role in defining a transmission system, it would then be patented and licensed to other users. Nothing wrong with that but their entry into the spectrum cost them nothing."

BRUCE PERENS

"Apple states that the operating conventions and rules for the NII Band should be developed by the information industry. They ignore that community radio networks have been operated for 15 years by the Amateur Service, and that many of the problems of operating such networks have already been dealt with by Radio Amateurs."

SOUTHERN CALIFORNIA REPEATER AND REMOTE BASE ASSOCIATION

"The petitioner apparently wants to obtain 'free' spectrum for 'free' and make large amounts of money selling equipment onto what can easily become a digital CB band. The petitioner apparently wants to circumvent both the licensing process and the fee process whereby a commercial use pays some resemblance to both costs and value for the spectrum."

"The petitioner indicates that the expected cost of the devices for this band will place them well within reach of individuals with even modest incomes. The potential for these devices to be sold by the local computer superstore along with every computer as an inexpensive way to gain access to the digital network is a scary thought. We urge the Commission to act to prevent a recurrence of the CB horrid mess from happening to any new unlicensed allocation."

WARP SPEED IMAGINEERING

"The important principles embodied in the Apple petition should guide the Commission in creating an NII Band, particularly if it is to employ spectrum at 5725-5875 MHz in which both Part 15 and Amateur Radio Service technologies are currently being developed and deployed. The combination of adequate spectrum and efficient pragmatic spectrum sharing rules should create an environ-

ment in which this new service with its innovative technologies could thrive."

FCC REDUCES FINES TO AMATEURS

Four amateurs found violating FCC rules in 1993 won substantial reductions in the amounts of their fines after they protested to the Commission. The FCC did not excuse the violations, however. In orders released July 10, 1995, the FCC rejected arguments from the hams that they were not responsible for the violations.

In 1993 the FCC established a policy for assessing forfeitures (fines). The policy included standard fines for each type of violation, and guidelines for revising the fines up or down depending on the facts of a particular case.

In 1994 the Court of Appeals for the D.C. Circuit rejected the FCC's forfeiture guidelines because the FCC did not follow proper procedures when it implemented them. This forced the FCC to use a different legal scheme in setting the fines for certain cases.

The decision hobbled the progress of FCC enforcement cases. Sometimes the FCC reduces fines that were issued under the old system.

John B. Genovese, WB5LOC (Slidell, LA)

The FCC found that on April 2, 1993, between 7:06 PM and 7:11 PM, WB5LOC transmitted on 147.27 MHz. He "used these signals to interfere with the communications of other amateur operators," the FCC said. Based on transcripts made from a recording of these transmissions, the New Orleans FCC Office issued him a Notice of Apparent Liability (NAL) for \$2000 on Sep. 10, 1993.

Genovese responded to the NAL, arguing that he never willfully, deliberately, or repeatedly caused interference to other amateur radio stations. He claimed he was not responsible because someone linked his signals from another frequency over to the frequency on which his transmission was recorded.

"The transcripts reveal that, at approximately 7:06 PM on April 2, 1993, Petitioner [Genovese] began transmitting over communications in progress on a directed net on frequency 147.27 MHz," the FCC said. "Essentially, Petitioner insisted that he was going to talk, whether recognized or not, and stated that no other station could tell him when he could talk. Petitioner's repeated transmission over net operations constituted willful or malicious interference in violation of Section 97.101(d)."

"With respect to Petitioner's argument that someone else linked his transmissions over from another frequency, we note that the content of Petitioner's transmissions demonstrate that he was aware that his transmissions were being broadcast to a net, which convened Friday evenings at 7:00 PM. Petitioner's transmissions also indicate that he was aware he was causing interference to communications of other stations. Therefore, it is clear

that the Petitioner could have stopped transmitting at any time. In these circumstances, Petitioner's claim that some other party may have been responsible for the interference is without merit."

Nevertheless, the FCC reduced Genovese's fine to \$500: "In this particular case, the duration of Petitioner's transmissions as recorded and transcribed do not warrant imposition of a higher fine."

Vernon A. Paroli, KA5OWW (New Orleans, LA)

"At approximately 8:04 PM on April 12, 1993, amateur radio station N5NBI, operating on 146.85 MHz, requested that operators checking into the net that evening wait for recognition before transmitting," the FCC said. "Station N5JNX was identified as one of two operators that would not be recognized by the net. Petitioner [Paroli], identifying himself as "KA5OWW mobile," made nine attempts to check in and not only was Petitioner not recognized, but he was also informed by net control station N5NBI that continued transmissions might constitute malicious interference.

"Petitioner made two more attempts to check in, then began a 28 minute conversation with amateur station N5NJB [sic] over communications already in progress. When the net moved operations to a new frequency of 146.76 MHz, Petitioner and station N5NJB [sic] followed and renewed their conversation over net operations for another 23 minutes until the net moved operations back to the original frequency of 146.85 MHz.

"Petitioner responded to the NAL, arguing that: he did not violate Section 97.101(d) of the rules; the transcripts upon which the NAL is based are incomplete or inaccurate and; he did not intentionally cause interference to other amateur operators, but that other amateurs interfered with his operations on the date in question. On November 5, 1993, the New Orleans Office issued a Notice of Forfeiture (NOF) for \$2000.

"The Petitioner now appeals stating that he did not violate Section 97.101(d) of the rules, contending again that the recordings and transcripts upon which the NAL is based are inaccurate or misleading, and now claiming inability to pay the forfeiture, submitting additional documentation in support."

The FCC denied the objections. "Although Petitioner contends that other amateurs interfered with his operations that evening, it is clear that Petitioner's own operations constituted malicious interference with communications already in progress," the agency said. The FCC also rejected the claim of KA5OWW that the recordings and transcripts on which the NAL is based are inaccurate or misleading.

"The transcripts were written by staff personnel at the Commission's New Orleans Office from recordings made the evening of April 12, 1993, by a local Amateur Auxiliary group. Use of amateur volunteers for the purpose of monitoring violations in the amateur service is per-

mitted by the Act. ...In fact, the amateur radio community has distinguished itself for its self-policing operations," the FCC said.

Even with this conclusion, the FCC reduced Paroli's fine to \$700. "This amount reflects a reduction based on Petitioner's supported claim that he is financially unable to pay the \$2000 forfeiture originally assessed."

Will T. Blanton, N5ROC (Carriere, MS)

According to transcripts of monitoring, "at approximately 7:01 PM on March 19, 1993, Petitioner [Blanton] began transmitting over communications on a directed net on frequency 147.27 MHz," the FCC said. "Petitioner indicated that he was going to talk, whether recognized or not. He then followed the net when it moved to 145.43 MHz and when it moved back to 147.27 MHz. Thus, Petitioner continued to disrupt communications until 7:45 pm. On April 2, 1993, Petitioner again caused interference on 147.27 MHz by transmitting over communications in progress until the net moved to another frequency."

However, the FCC reduced Blanton's fine from \$2000 to \$1000: "Recognizing the serious problem of willful or malicious interference to communications on amateur radio frequencies, taking into account congressional interest in this problem...and given the evidence in this case, demonstrating that Petitioner's actions could not in any way be considered accidental, or unintentional, we conclude that the appropriate forfeiture amount is \$1,000."

The FCC did not explain in detail why it reduced the fine. Blanton did not ask for a reduction based on inability to pay, for example.

Joseph F. Richard III, N5JNX (New Orleans, LA)

"At approximately 8:13 PM on April 12, 1993, amateur radio station N5NBI, operating on 146.85 MHz, requested that operators checking into the net that evening wait for recognition before transmitting. Petitioner's station N5JNX was identified as one of two operators that would not be recognized by the net," the FCC said.

"Despite this fact, Petitioner engaged amateur station KA5OWW in conversation for 30 minutes over communications in progress. When the net moved operations to a new frequency of 146.76 MHz, Petitioner and station KA5OWW followed to the new frequency and renewed their conversation over communications in progress on this frequency for another 23 minutes until the net moved operations back to the original frequency of 146.85 MHz."

Richard appealed his fine of \$2000, stating that no particular complainant claimed that he was interfering with their communications, that the FCC relied on doctored or inaccurate tapes and transcripts, and that the New Orleans FCC Office that issued his fine was not objective.

The FCC rejected these claims. However, explaining that it "reconsidered the monetary forfeiture amount" in accordance with the Communications Act, the FCC reduced Richard's fine from \$2000 to \$1000.

THE MILITARY AND THE MORSE CODE

About the third week in July we received some reports from readers that the military and the MARS program in particular was discontinuing all use of manual Morse code. It seems that a message concerning use of CW which had its roots at the Pentagon was distributed to the Chiefs of the U.S. Armed Forces. We started investigating.

The Military Affiliate Radio System (MARS) encompasses all three of the U.S. armed forces. MARS operates numerous communications networks, all of which are outside the amateur bands on military frequencies. It is therefore not really Amateur Radio. Thousands of amateurs, however, participate in MARS and their knowledge of radiotelegraphy has always been considered to be an asset to the Military Affiliate Radio System and the Department of Defense.

The main mission of MARS is to provide a backup to military communications and to support world-wide civil emergency and disaster communications at the local, national and international level. MARS also handles health, morale and welfare oriented traffic.

We learned that the following MARS message was transmitted from Air Force MARS at Scott Air Force Base in Illinois. We telephoned the Director of Air Force MARS - a M/Sgt Ken Davis/KF9IA who, it turns out, was familiar with our VEC program. He referred us to a Harold "Ray" Collins, who as the Chief Air Force MARS, has the top position in the system.

Collins is not a licensed ham operator, but he did tell me that he can still copy CW at 40 wpm. I learned that he went through the Air Force radio operator training program at the same time I did: in the early 1950's.

Ray Collins confirmed that it was he that authored the message that had been sent me. It was only intended for MARS stations and apparently some MARS member had put the message out on the Internet. Collins said he was only retransmitting a message that he had received from the Department of Defense at the Pentagon. The message follows:

Subject: MARS Broadcast No 21,
Dated: 19July1995 - Broadcast stations do not release
prior to 1800Z 19July1995
Item: 043:ASD/C3I Memo

The following memo, dated 28June1995 was released by the Assistant Secretary of Defense for Command Control Communications and Intelligence.

Subject: MARS Continuous Wave Morse Code:

Quote, Effective October 1, 1996, it is directed that the CW mode of communications will no longer be used on any Dept. of Defense MARS circuits, networks or frequencies. MARS has been steadfastly evolving to newer tech-

nologies to improve service. Technology such as single sideband replaced amplitude modulation to provide greater frequency efficiency. Likewise packet radio, AMTOR, PACTOR, GTOR and CLOVER modes of operation have replaced radio teletype. CW use and need in MARS communications has diminished over the years. It is recognized that CW can no longer compete with the rapid advancement in radio technology. Therefore, CW is to be retired from use within the DOD MARS.

Signed: Emmett Paige, Jr. Unquote

As an Assistant Secretary of Defense specializing in communications, Mr. Emmett Paige is the highest ranking licensed ham operator (station call sign W2IPG) in the Clinton administration. He has overall authority over all U.S. military communications.

Paige retired as a 3-star General of the Army in 1988. His views relative to Morse code communications confirm that the U.S. military has discontinued use of manual telegraphy and it no longer teaches the Morse code at any of its military schools.

After several attempts, I finally reached General Paige by telephone at the Pentagon on July 27. He told me how he started as a military radio operator in 1947 and got his ham ticket in 1953. I asked him about the memo that had been attributed to him in the Air Force MARS message.

"That message went out to more than just MARS programs," he said. "That message went to the secretaries of the services. I don't remember sending one to MARS. What probably happened is that someone probably got the memo that I sent out and translated it into a MARS message. The action document was not a message. It was a memo that was sent to the services and the defense agencies. All of the service chiefs got that. Each service has their own MARS program. You will not find CW anywhere else today but in MARS."

Paige went on to explain that Morse code had been automated, "You don't need a human now to copy and translate Morse code." He said the only possible use of CW today was for intercept operations since some third world countries still use Morse code but that these transmissions could be easily read automatically by code readers.

I explained that our organization was one of the original VEC groups and that many ...if not most new applicants do not wish to learn the Morse code in order to access the HF frequencies.

"I understand ...and I believe that the hobby will benefit... Although we have a no-Morse code license today, I think once we eliminate it altogether, it will be better for the hobby overall. As you probably know, the Coast Guard also has deactivated the code," General Paige said.